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भारतीय मानक

# तुलसी का तेल, मिथाइलचेवीकोल टाइप — विशिष्टि

*Indian Standard*

# OIL OF BASIL, METHYLCHAVICOL TYPE — SPECIFICATION

ICS 71.100.60

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**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*June* 2002

**Price Group 2**

## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural and Synthetic Fragrance Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Oil of basil is obtained from *Ocimum basilicum* leaves or twigs. The botanical *Ocimum basilicum L.* includes a number of varieties and therefore different types of basil are distilled. There are about 50-60 Ocimum species in tropical Asia, Africa and USA. The highest quality of basil oil is laevorotatory and largely consists of methylchavicol and linalool. The oil is isolated by steam distillation of fresh and semi dried/dried herb. The oil of basil is commonly used in balsamic complexes and as a trace constituent in nature-based perfumes.

Considerable assistance has been derived from French standard NF T 75 – 357 'Essential oils – Oil of basil, methylchavicol type (*Ocimum basilicum Linnaeus*)' for formulating the Indian Standard taking into consideration the difference in characteristics of the Indian variety of basil oil presently manufactured in the country.

International Organization for Standardization (ISO) has published ISO 11043 for 'oil of basil, methylchavicol type *(Ocimum basilicum L.)*' in 1998. This Indian Standard differs from ISO 11043 mainly in the following respects:

a) Temperature for determination of 'relative density' and 'refractive index' has been stipulated at 27 °C in place of 20 °C as specified in ISO standard and the stipulated ranges for both the requirements varies to some extent.
b) There is no stipulation regarding temperature of determination in Indian Standard for 'optical rotation', whereas ISO standard has specified 20 °C for its determination.
c) Chromatographic profile as given in Table 1 of ISO standard has identified 1, 8 cineole, trans-ocimene, camphor, terpinen-4-ol and methyl eugenol with *Min* and *Max* as Normative in addition to methylchavicol and linalool as specified in the Indian draft due to lack of data.
d) Information on flash point has been given in Annex B of ISO standard, whereas no such information could be included in Indian Standard due to lack of data.
e) No stipulation have been made in the ISO standard for acid value and total alcohol content.

Therefore, this standard is not equivalent to ISO 11043.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# OIL OF BASIL, METHYLCHAVICOL TYPE — SPECIFICATION

## 1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for oil of basil, methylchavicol type (*Ocimum basilicum L.*).

## 2 REFERENCES

The following standards contain provisions which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| *IS No.* | *Title* |
|---|---|
| 326 | Methods of sampling and test for natural and synthetic perfumery materials: |
| (Part 1) : 1984 | Sampling (*second revision*) |
| (Part 2) : 1980 | Preliminary examination of perfumery materials and samples (*second revision*) |
| (Part 3) : 1980 | Relative density (*second revision*) |
| (Part 4) : 1980 | Determination of optical rotation (*second revision*) |
| (Part 5) : 1986 | Determination of refractive index (*second revision*) |
| (Part 6) : 1986 | Determination of solubility (*second revision*) |
| (Part 7) : 1980 | Determination of acid value (*second revision*) |
| (Part 8) : 1980 | Determination of ester value, content of esters and alcohols (*second revision*) |
| (Part 19) : 1998 | Gas chromatographic analysis of perfumery materials |
| 1070 : 1992 | Reagent grade water (*third revision*) |
| 2284 : 1988 | Method for olfactory assessment of natural and synthetic perfumery materials (*second revision*) |
| 6597 : 2001 | Glossary of terms relating to natural and synthetic perfumery materials (*second revision*) |

## 3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 6597 and the following shall apply.

### 3.1 Oil of Basil, Methylchavicol Type

Essential oil obtained by steam distillation of the leaves of Lamiaceae family.

## 4 REQUIREMENTS

### 4.1 Description

**4.1.1** The material shall be a clear liquid of pale yellow to amber yellow colour, free from sediment, suspended matter and adulterants, when examined as prescribed in IS 326 (Part 2).

### 4.2 Solubility

The material shall not require more than seven volumes of ethanol (80 percent by volume) to obtain clear solution at 27°C when tested as prescribed in IS 326 (Part 6).

**4.3** The material shall also comply with the requirements given in Tables 1 and 2.

**Table 1 Requirements for Oil of Basil**

| Sl No. | Characteristic | Requirement | Method of Test Ref to IS |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Odour | Characteristic spicy herbal, anise like | 2284 |
| ii) | [1] Relative density at 27°C/27°C | 0.905–0.962 | 326(Part 3) |
| iii) | [1] Refractive index at 27°C | 1.458–1.548 | 326(Part 5) |
| iv) | Optical rotation | – 6° to +7.5° | 326(Part 4) |
| v) | Acid value, *Max* | 1 | 326(Part 7) |
| vi) | Total alcohol content, percent by mass | 19–37 | 326(Part 8) |

[1] The correction factor for relative density [*see* IS 326(Part 3)] and refractive index [*see* IS 326(Part 5)] for each degree celsius change in temperature is 0.000 64 and 0.000 38 respectively.

**Table 2 Chromatographic Profile**

| Sl No. | Component | Minimum | Maximum |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| i) | Methylchavicol content, percent by mass | 75 | 87 |
| ii) | Linalool content, percent by mass | 8 | 18 |

### 4.4 Chromatographic Profile

Analysis of the essential oil shall be carried out by gas chromatography as per Annex A. In the chromatogram obtained, the representative and characteristic components shown in Table 2 shall be identified. The proportions of these components, indicated by the integrator, shall be as shown in Table 2. This constitutes the chromatographic profile of the essential oil.

## 5 PACKING AND MARKING

### 5.1 Packing

The material shall be supplied in airtight and preferably amber-coloured glass, aluminium or tin-plate containers, permitting a minimum of air space, or as agreed to between the purchaser and the supplier.

**5.1.1** The material shall be protected from light and stored in a cool and dry place.

### 5.2 Marking

Each container so packed shall bear legibly the following information:

a) Name of the material;
b) Name of the manufacturer and his recognized trade-mark, if any;
c) Batch number and date of manufacture; and
d) Net and gross mass.

**5.2.1** *BIS Certification Marking*

The containers may also be marked with the Standard Mark.

**5.2.1.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 6 SAMPLING

Representative samples of the materials, each sample containing not less than 50 ml, shall be drawn as prescribed under IS 326 (Part 1).

## 7 NUMBER OF TESTS

**7.1** Test for the determination of all the characteristics shall be conducted on the composite sample as prescribed in **4.1**, **4.2**, and Tables 1 and 2.

### 7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water shall be used in tests (*see* IS 1070).

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the result of the analysis.

## ANNEX A

(*Clause* 4.4)

## GAS CHROMATOGRAPHIC ANALYSIS OF OIL OF BASIL

## A-1 GENERAL

The chromatographic analysis is given on capillary column. The chromatographic conditions given here are for information and guidance.

## A-2 PROCEDURE

**A-2.1** The analysis shall be done as per IS 326 (Part 19). The typical chromatograms for oil of basil in capillary column with the following chromatographic conditions are shown in Fig. 1 and 2.

**A-2.1.1** *Capillary Column — Polar*

| | |
|---|---|
| Column | Carbowax |
| Material | Stainless steel |
| Length | 40 m |
| O.D. | 0.318 cm |
| Stationary Phase and solid support | 15 percent FFAP by mass on chromosorb WHP 80-100 mesh |
| Carrier gas conditions | Nitrogen |
| Oven temperature | 120°C |
| Injection port temperature | 220°C |
| Detector type | FID |
| Temperature | 220°C |

**A-2.1.2** *Capillary Column — Non-Polar*

| | |
|---|---|
| Column | SPB-5 |
| Material | Stainless steel |
| Length | 30 m |
| O.D. | 0.318 cm |
| Stationary phase and solid support | 15 percent FFAP by mass on chromosorb WHP 80-100 mesh |
| Carrier gas conditions | Nitrogen |
| Oven temperature | 70°C |
| Injection port temperature | 240°C |
| Detector type | FID |
| Temperature | 240°C |

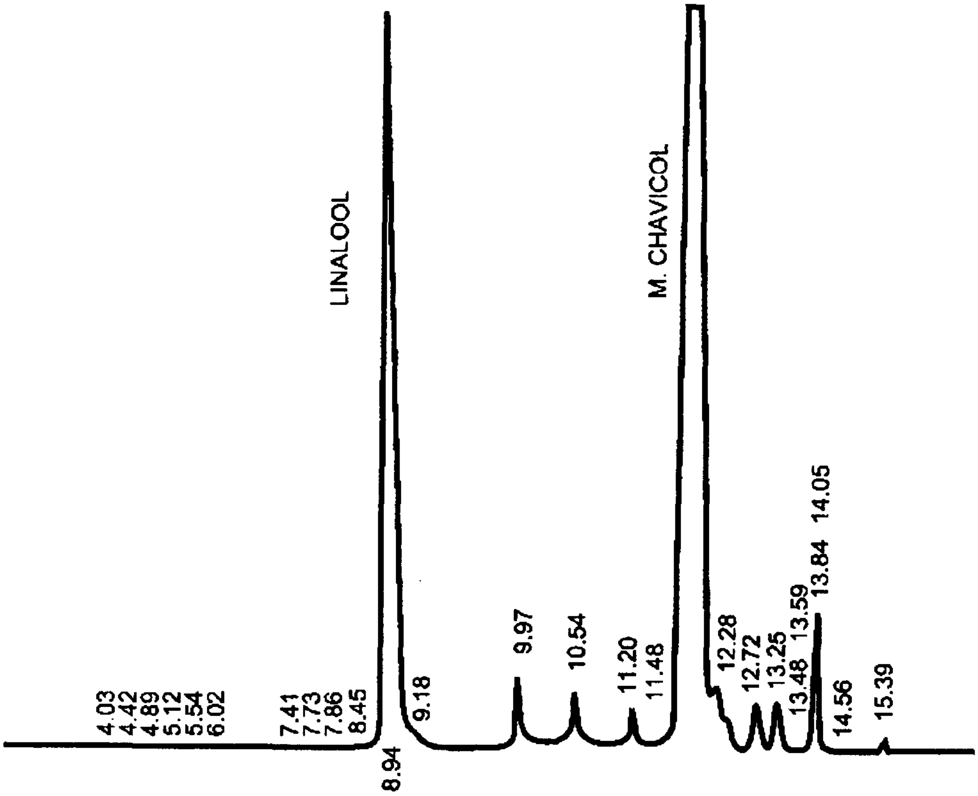

FIG. 1 OIL OF BASIL — GC — POLAR COLUMN

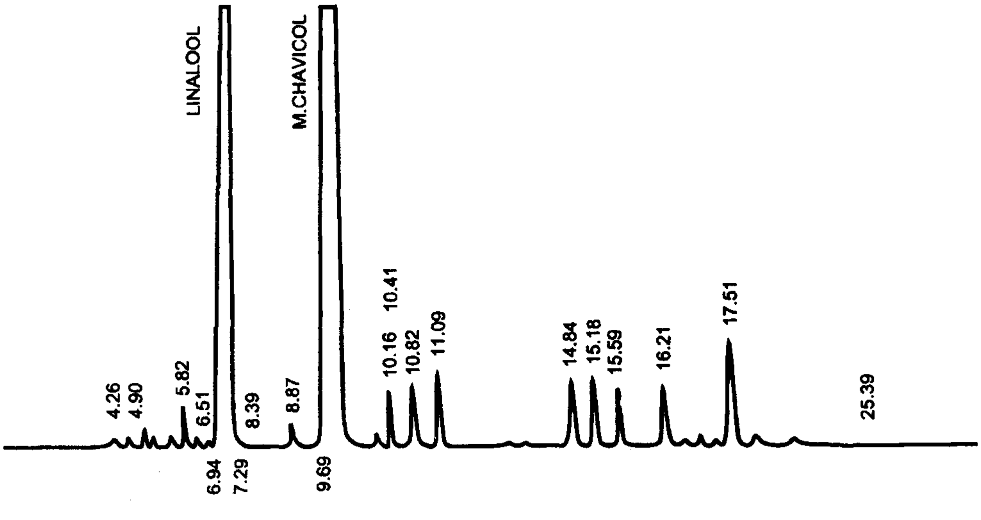

FIG. 2 OIL OF BASIL — GC — NON-POLAR COLUMN

# ANNEX B

## ( *Foreword* )

## COMMITTEE COMPOSITION

### Natural and Synthetic Fragrance Materials Sectional Committee, PCD 18

| *Organization* | *Representative(s)* |
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### Amendments Issued Since Publication

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